

Claims:

1. A polishing pad suitable for planarizing at least one of semiconductor, optical and magnetic substrates, the polishing pad comprising a cast polyurethane polymeric material formed from a prepolymer reaction of a prepolymer polyol and a polyfunctional isocyanate to form an isocyanate-terminated reaction product, the isocyanate-terminated reaction product having 4.5 to 8.7 weight percent NCO reaction group, the isocyanate-terminated reaction product being cured with a curative agent selected from the group comprising curative polyamines, curative polyols, curative alcoholamines and mixtures thereof; and the polishing pad containing at least 0.1 volume percent filler or porosity.
2. The polishing pad of claim 1 wherein the prepolymer polyol is selected from the group comprising polytetramethylene ether glycol, polyester polyols, polypropylene ether glycols, polycaprolactone polyols, copolymers thereof and mixtures thereof.
3. The polishing pad of claim 2 wherein the curative agent contains curative amines that cure the isocyanate-terminated reaction product and the isocyanate-terminated reaction product has an NH_2 to NCO stoichiometric ratio of 80 to 120 percent.
4. A polishing pad suitable for planarizing semiconductor substrates, the polishing pad comprising a cast polyurethane polymeric material formed from a prepolymer reaction of a prepolymer polyol selected from the group comprising polytetramethylene ether glycol, polyester polyols, polypropylene ether glycols, copolymers thereof and mixtures thereof and a polyfunctional isocyanate to form an isocyanate-terminated reaction product, the isocyanate-terminated reaction product having 4.5 to 8.7 weight percent NCO reaction group, the isocyanate-terminated reaction product being cured with a curative agent with expandable polymeric microspheres, the curative agent selected from the group comprising curative polyamines, curative polyols, curative alcoholamines and mixtures thereof; and the polishing pad containing a porosity of at least 0.1 volume percent.

5. The polishing pad of claim 4 wherein the curative agent contains curative amines that cure the isocyanate-terminated reaction product and the isocyanate-terminated reaction product has an NH_2 to NCO stoichiometric ratio of 80 to 120 percent.
6. The polishing pad of claim 4 wherein the prepolymer polyol contains polytetramethylene ether glycol, copolymer thereof or a mixture thereof.
7. The polishing pad of claim 4 wherein the prepolymer polyol contains polyester polyols, copolymer thereof or a mixture thereof.
8. The polishing pad of claim 4 wherein the prepolymer polyol contains polypropylene ether glycols, copolymer thereof or a mixture thereof.
9. A method of forming a polishing pad suitable for planarizing semiconductor substrates comprising casting polyurethane polymeric material from a prepolymer reaction of a prepolymer polyol and a polyfunctional isocyanate to form an isocyanate-terminated reaction product, the isocyanate-terminated reaction product having 4.5 to 8.7 weight percent NCO reaction group, the isocyanate-terminated reaction product being cured with a curative agent selected from the group comprising curative polyamines, curative polyols, curative alcoholamines and mixtures thereof; and the polishing pad containing at least 0.1 volume percent filler or porosity.
10. The polishing pad of claim 1 wherein the polymeric material includes expandable polymeric microspheres and including the step of limiting the exotherm to a temperature below 120 °C.